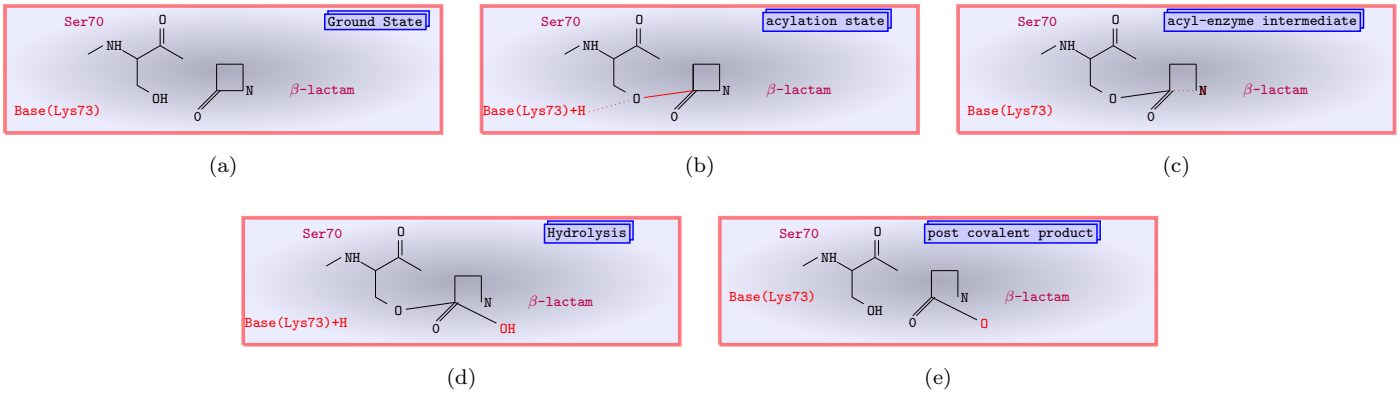

Supplementary Fig. 3: **The overall pathway for β-lactam hydrolysis** There are two main steps - acylation and hydrolysis. The acylation is common to β-lactamases and penicillin-binding proteins (PBP). Thus antibiotic resistance essentially arises from the deacylation reaction. Starting with the ground state (**a**) and passing through a high energy acylation state (**b**) the acyl-enyzme intermediate is formed (**c**) due to the nucleophilic attack of the serine on the β-lactam. The next step is hydrolysis (**d**) and finally the product is formed (**e**), and the enzyme is ready for another cycle.